(No Model.)

O. E. MICHAELIS.

ADJUSTABLE POWDER CHARGER.

No. 272,072. Patented Feb. 13, 1883.

Fig. 1.

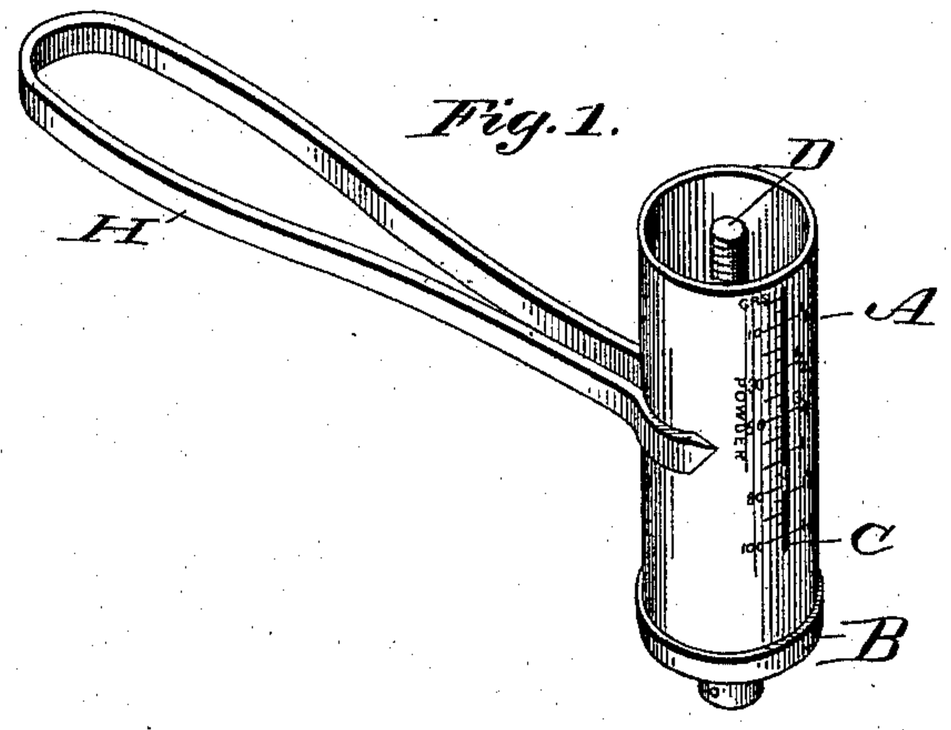


Fig. 2.

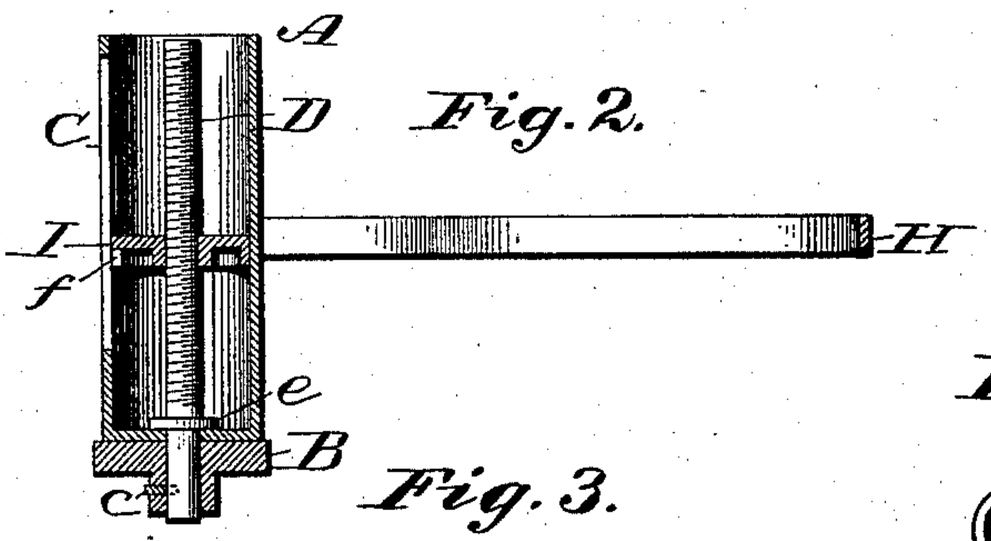
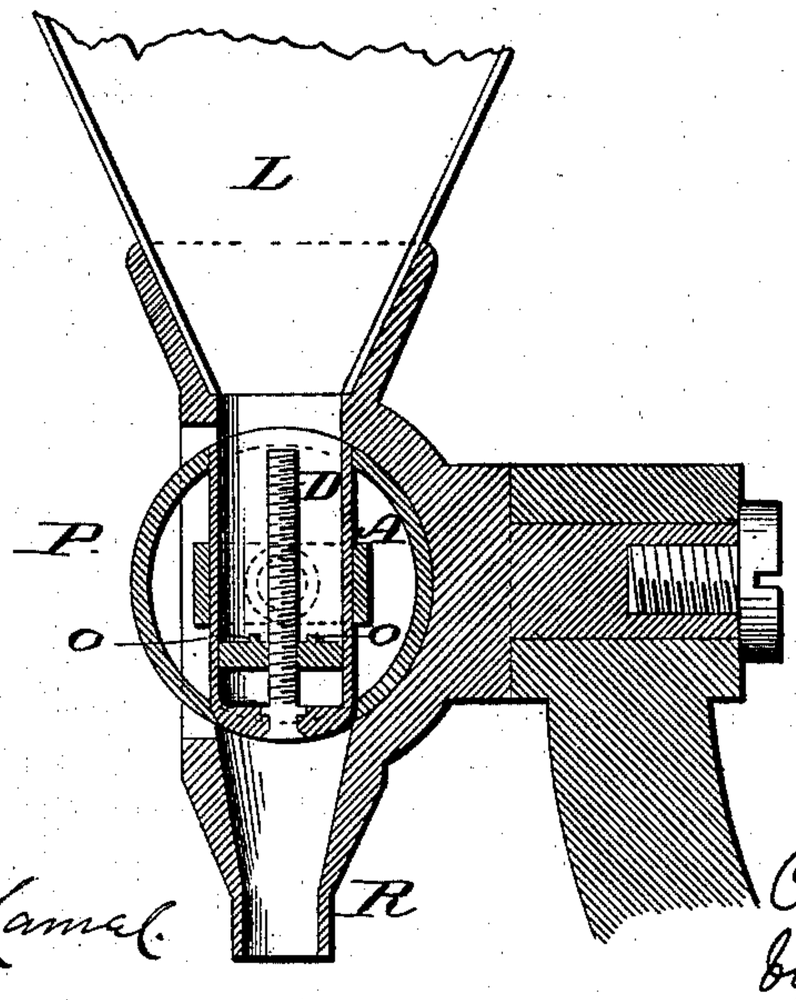


Fig. 4.

Fig. 3.



Witnesses.

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OTHO E. MICHAELIS, OF THE UNITED STATES ARMY, ASSIGNOR OF ONE-HALF TO S. C. LYFORD, OF PHILADELPHIA, PENNSYLVANIA.

ADJUSTABLE POWDER-CHARGER.

SPECIFICATION forming part of Letters Patent No. 272,072, dated February 13, 1883.

Application filed November 8, 1882. (No model.)

To all whom it may concern:

Be it known that I, Capt. O. E. MICHAELIS, (Ordnance Department United States Army,) of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Powder-Chargers, &c., of which the following is a specification.

My present invention relates to adjustable measures, such as are ordinarily used for measuring powder, shot, and similar materials; and the invention consists in a novel construction of the device, whereby it is rendered capable of being adjusted for different quantities with great accuracy, and is also capable of very fine adjustments or variations from its maximum to its minimum capacity, all as hereinafter more fully set forth.

Figure 1 is a perspective view of a charger embodying my improvements. Fig. 2 is a transverse vertical section of the same, and Fig. 3 illustrates the invention as applied to a cartridge-loading machine. Fig. 4 is a perspective view of the adjustable bottom, shown detached.

Heretofore it has been customary to construct chargers for measuring powder and shot of two short tubes, one having its bottom closed and the other sliding telescopically thereon. A charger thus made, while capable of limited adjustments, is not capable being adjusted with any great degree of accuracy, and hence is not suitable for measuring powder for use in the fire-arms of the present day, where the range is so great that a slight variation in the quantity or density of the powder used will materially affect the result. To obviate this objection and produce a charger that shall be capable of very accurate and fine adjustment, and that may have a far greater range of adjustment than usual, is the object of my present invention.

To accomplish these results I construct my improved charger as follows: I provide a cup, A, preferably of the form shown in Figs. 1 and 2, of a size sufficient to hold the largest quantity that may be required, this cup A having, for convenience, a handle, H, attached as represented in Figs. 1 and 2. Through the bottom of this cup, at its center, I bore a hole, and insert therein the journal or neck of a small threaded stem or rod, D, of a length equal or nearly equal to that of the cup or cylinder, as shown in Fig. 2. This stem D is provided with a fixed collar, *e*, which rests upon the inner surface of the bottom and projects down through the same, and has secured upon its lower end a disk, B, slightly larger in diameter than the cup, the edge of this disk being milled for convenience in turning it, as hereinafter set forth. I have shown the disk B as being rigidly secured to the stem D by a small pin or screw, *c*, Fig. 2; but, if preferred, it may be soldered or riveted thereon, or may be screwed on, or fastened in any suitable manner. I then provide another disk or diaphragm, I, of such a diameter as to fit accurately within the cup or cylinder A and be capable of sliding freely therein. This disk I has a hole through its center, in which a screw-thread is formed to fit the thread on the stem D, so that by turning the stem by means of the milled disk B at the bottom the disk I will be moved up or down within the cup or cylinder A according as the stem D is turned in the one or the other direction, the disk I thus forming an adjustable bottom that may be moved up or down within the cup or cylinder to any desired extent throughout its entire length.

In order to hold the disk I at any point to which it may be adjusted, and prevent any accidental movement of the same by turning on the stem or otherwise, I form it with a flange, *f*, as shown in Fig. 2, this flange being cut loose from the body of the disk part way around, and which is also severed vertically, so that its free ends may be slightly sprung outward, thereby forming a friction-spring, which will hold it securely in place wherever adjusted. It is obvious that this friction-spring may be made of a separate piece, and be soldered or otherwise secured to the disk I, and be made to operate the same; but I prefer the plan shown, as it makes a very accurate fit and a nice finish when thus constructed. So, too, instead of the milled disk B, a thumb-piece may be secured upon the end of stem D for turning the same; but I prefer the plan shown.

Through the side of the cup A, I cut a vertical slit, C, as shown in Figs. 1 and 2, and upon the exterior wall of the cup, along one side of this slit, I arrange a series of graduation-marks, with numerals indicating the number of grains of powder that the cup will hold when the movable bottom or disk is adjusted to these various points, the slit C permitting the edge of the disk to be seen through the same, so that it may be accurately adjusted to any desired point up or down. The numerals on the left-hand side of the slit shown in Fig. 1 are designed for measuring powder, and it will be observed that graduation-marks indicating grains, and, if desired, fractions of a grain, are interposed at regular intervals between the numerals, thus enabling the disk to be adjusted with the greatest accuracy and for any desired quantity. The numerals on the right-hand side of the slit are in like manner arranged to indicate the quantity of shot that the charger will hold when the disk I is adjusted at either of the several points indicated. I have shown the charger as being graduated to measure any number of grains of powder from 0 up to 100 and to measure shot from $\frac{1}{4}$ of an ounce up to $1\frac{1}{2}$ ounce; but it is obvious that the range for either or both may be extended, if desired, these, however, being sufficient for all ordinary purposes.

It is well known to persons skilled in the art that powder varies in density, and that it is difficult, if not impossible, to make different batches of the same of uniform density. It therefore becomes necessary, when very accurate results in firing are required, to make a slight variation in the bulk or quantity of the powder to compensate for this variation in density. The very fine and accurate adjustments provided for in my charger enables this to be done with ease, whereas in the ordinary chargers it is impossible, and, in fact, is never attempted with them. If the powder is of greater density than usual, then a correspondingly less quantity will be used, and vice versa, and by these means greater accuracy can be secured in shooting, especially with long-range target-rifles, now so extensively used.

In Fig. 3 I have illustrated my improved charger as applied to the powder-hopper of a cartridge-loading machine. In this case the cup or cylinder A, with its adjustable bottom or diaphragm I and screw-stem D, is shown secured in a rotating plug, P, which is arranged to operate like the plug of a faucet. When the plug is turned so as to bring the mouth of the cup or cylinder A uppermost, as represented in Fig. 3, it will receive a charge of powder from the hopper L, located above, and then, as the plug is turned to the right, communication between the cup and the hopper will be closed, and when the cup has become inverted by the semi-rotation of the plug the powder therein will fall out through the nozzle R below and fall into the cartridge-shell. (Not shown.) To adjust the disk I in this case, the plug P is turned so as to bring the mouth of the cup A at the lower side, when a screw-driver or tool made for the purpose, and having the graduation-points marked on it, is inserted from below through the nozzle R and made to engage with projections *o* on the disk I, when it can be turned, and thereby adjusted as desired. In such case the graduation-points on the screw-driver or tool will of course be made or arranged in relation to the distance from the end of the nozzle R to the plug P. For instance, the points and numerals on the screw-driver will be so located thereon that when the disk I is at the extreme open end or mouth of the cup or cylinder A, and the screw-driver is inserted in the nozzle and engaged with the disk I, the zero-point on the tool will be even with the end of the nozzle, and then as it is turned so as to screw the disk toward the bottom of the cup the tool moving inward with the disk will accurately indicate the adjustment of the disk, and consequently the quantity of powder that the charger will hold.

It will thus be seen that my improved charger is equally available as a hand-charger and also as a charger for cartridge-loading machines.

While I have shown and described my improved device as applied to the measurement of powder and shot, it is obvious that it is equally applicable to the measurement of other substances where frequent or accurate adjustment is required.

Having thus fully described my invention, what I claim is—

1. The herein-described charger or measuring implement, consisting of a cup or cylinder, A, provided with the movable bottom or diaphragm I, and adjusting screw-stem D, journaled in the bottom of the cup, substantially as described.

2. In combination with the cup or cylinder A, the movable bottom or diaphragm I, and the adjusting screw-stem D, journaled to the bottom of the cup, and provided with the milled disk B or equivalent means for turning the same, substantially as and for the purpose set forth.

3. The cup or cylinder A, provided with the slit C and suitable graduation-marks, in combination with the adjustable bottom or diaphragm I and the screw-stem D, all arranged to operate substantially as described.

4. The adjustable diaphragm or bottom I, provided with the friction-spring or flange *f*, when arranged to operate substantially as herein set forth.

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